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Original Article

Upper Blepharoplasty and Lateral Wound Dehiscence

Mohsen Bahmani Kashkouli, Mansooreh Jamshidian-Tehrani, Sahab Sharzad, Mostafa Soltan Sanjari

ABSTRACT

Purpose: To report the frequency of lateral wound dehiscence (LWD) after upper blepharoplasty (UB), a technique and its outcome to prevent LWD.

Materials and Methods: A retrospective review was performed for cases of LWD after UB presenting between 2003 and 2009, and then a prospective comparative study was performed between February 2009 and March 2013. For the comparison, subjects were divided into two groups based on intraoperative assessment of lateral wound tension (same technique and surgeon). Group 1 received 1-3 orbicularis/subcutaneous buried sutures (6-0 polyglactin) before interrupted 6-0 nylon skin closure. Group 2 underwent skin closure only. Subjects, who had re-operation, skin healing disorders, and incomplete follow-up (<6 months), were excluded. $P < 0.05$ was considered as statistically significant.

Results: There were 14 (14/678, 2%) cases with LWD with a mean age of 36.2 years in the audit (2003–2009). The prospective study included 68 subjects (68/293, 23.2%) in Group 1 and 225 in Group 2. Gender and simultaneous forehead and eyebrow procedures were similar between groups ($P = 0.3$ and $P = 0.4$ respectively). Group 1 was statistically significantly younger at mean age of 41.4 years, compared to Group 2 at 56.1 years ($P = 0.000$). The frequency of LWD significantly ($P = 0.04$) decreased to 0.3% (1/293).

Conclusion: In the presence of wound tension on skin closure (intraoperative assessment), tension relieving buried orbicularis/subcutaneous 6-0 polyglactin suturing of the lateral UB incision could prevent LWD.

Key words: Blepharoplasty, Eyebrow Ptosis, Lateral Hooding, Upper Blepharoplasty, Wound Dehiscence

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INTRODUCTION

Upper blepharoplasty (UB) is a very common cosmetic procedures, but the technique has not been appropriately discussed in the medical literature.¹ Although patient satisfaction is high with UB, there are subtleties in closure techniques that affect outcomes.² Differences in technique include cutting techniques, cutting instruments, suture material, and suturing techniques.^{3,4} The best features of the upper eyelid are lateral convexity without hooding and medial concavity. The problem of lateral hooding in

the presence of normal eyebrow position has received less attention in the literature. Different wide excision shapes of the lateral eyelid skin have been recommended to correct hooding.^{5,6} The eyelid defect in UB is generally a low tension defect except for its lateral section after a wide excision of lateral hooding in subjects with a well-positioned eyebrow. Although a wide excision of the lateral side did not result in lateral wound dehiscence (LWD) in some studies,^{2,5} we have observed this complication in a few of our subjects after skin

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suture removal [Figure 1]. LWD was also reported in two subjects (2/142, 1.4%) in another study.¹

To the best of our knowledge, the frequency of LWD after UB has not been reported in the literature and no study has evaluated this complication. The aims of this study are to report the frequency of LWD in an audit of our UB procedures (April 2003–February 2009), report the technique and results of a simple measure to prevent the LWD (March 2009–March 2013), and assess the impact of different variables on LWD.

MATERIALS AND METHODS

A retrospective study was performed to determine the frequency of LWD in subjects who had undergone UB from September 2003 to January 2009. LWD was defined as a wide, noninflamed, and flat scar at the lateral third to quarter of UB incision [Figure 1]. All procedures were performed with a wider lateral skin excision and 6-0 nylon interrupted skin closure by one surgeon (MBK) with and without other facial rejuvenation procedures. As no other risk factors (systemic disease, wound infection or hematoma) were found, LWD was assumed to be resulted from a wound tension during the healing phase. Therefore, a prospective study was designed to evaluate the frequency of LWD in patients undergoing UB with and without tension relieving sutures at the wider lateral skin excision. One surgeon using the same UB technique performed surgery on patients. Subjects were divided into two groups based on intraoperative assessment of lateral wound tension by the surgeon. Group 1 received 1-3 orbicularis/subcutaneous buried sutures (6-0 polyglactin) before interrupted 6-0 nylon skin closure and Group 2 underwent the latter. Follow-up was 6 months or longer. This study was approved by the Institutional Review Board/Ethics Committee of the Iran University Eye Research Center. Informed consent was obtained from the participants. Subjects were specifically informed that if a lateral scar occurs, it could take months to years to become negligible. All subjects had a detailed ocular and facial examination with measurement of periocular parameters regarding the eyebrow and eyelid position. Subjects with re-operation, skin disorder, and <6 months follow-up were excluded.

Marking of the lateral hooding was performed on sitting and then completed in the supine position. Typical marking for the UB included gradually more skin from medial to lateral side [Figure 2]. The marking was turned upward to avoid the unwanted downturned, crescent-shaped appearance and to address the lateral hooding [Figure 2]. The vertical distance between the lateral canthus and the lower line generally varied from 5 mm to 7 mm [Figure 2]. Radiofrequency incision was recruited in all UB procedures for better hemostasis intraoperatively and less hematoma postoperatively.⁴ Orbicularis oculi muscle was not excised to preserve the fullness in the upper



Figure 1: Different degrees of lateral wound dehiscence after an upper blepharoplasty procedure



Figure 2: Upper blepharoplasty marking shows a wider area of lateral skin excision to address the lateral hooding



Figure 3: Wider excision of the lateral skin and preservation of the orbicularis oculi muscle in upper blepharoplasty. The maximum wound tension is in the widest area of the excised skin

eyelid which is typical of a youthful eye and minimizes edema and bruising⁷ [Figure 3]. Assessment of wound tension on skin edges was performed by the surgeon using two pairs of tooth forceps at the time of wound closure. It was assessed by pulling and draping two skin wound edges while putting pressure on the superior orbital rim (thumb finger) in order to cancel the frontalis muscle action. If the edges were not approximated, the wound would be considered as wound under tension (Group 1). In the presence of tension on the wound, the first buried suture

on orbicularis/subcutaneous tissue (6-0 polyglactin, vicryl, and ethicon) was placed where the incision had been slanted upward [Figure 4, top-right and bottom-left]. If there was still wound tension on either side, another suture would have been placed laterally and/or medially to the first one. The aim was to completely relieve the wound tension [Figure 4, bottom-middle]. The wound was then closed using 6-0 nylon (Ethilon, Ethicon) interrupted sutures [Figure 4, bottom-right]. No dressing was used. Postoperative medications and instructions were cold compress (first 2–3 days), warm compress (next 2–3 days), topical antibiotic and steroid ointments (5–7 days), and silicone gel at the lateral wound (Stratpharma, Basel, Switzerland) (3–6 months). Postoperative assessments were performed at 1-day (wound and eye assessment), 5–7 days (suture removal), 2 months (possible touch-up procedure), and 6 months (final assessment). Chi-square and sample *t*-tests were used for statistical analysis. A $P < 0.05$ was considered as statistically significant.

RESULTS

The retrospective audit of subjects, who underwent between September 2003 and January 2009, showed 14 (14/678, 2%) subjects with LWD without systemic disease, wound infection, or hematoma. Subjects with LWD had a mean age of 36.2 (range, 23–45) years, and 92.9% (13/14) were female. One subject (1/14) had simultaneous endoscopic forehead lift. The LWD was recorded between 6 and 9 weeks postoperatively.

The prospective case series included 68 subjects (68/293, 23.2%) in Group 1 and 225 (76.8%) in Group 2. Group 1 received 1–3 orbicularis/subcutaneous buried sutures (6-0 polyglactin) before interrupted 6-0 nylon skin closure and Group 2 just had the latter. There were 58 females (58/68, 85.2%) in Group 1 and

185 (185/225, 82.2%) in Group 2 ($P = 0.3$). The groups were statistically matched with regard to simultaneous eyebrow lift procedures ($P = 0.4$). Endoscopic forehead lift and internal browpexy were performed in 11.7% (8/68) of the subjects in Group 1 and 13.7% (31/225) in Group 2 ($P = 0.4$). The mean age of Group 1 was statistically significantly lower at 41.4 years compared to Group 2 at 56.1 years ($P = 0.000$). No systemic disease was linked to poor wound healing despite five subjects with controlled type 2 diabetes mellitus in Group 2.

There was no LWD in Group 1 [Figure 5] and one subject with LWD in the Group 2. The frequency of LWD was 0.3% (1/293) in subject who underwent UB without eyebrow lifting. No other complications were observed. Adding 1–3 orbicularis/subcutaneous buried sutures, based on surgeon assessment of wound tension, statistically significantly decreased the frequency of LWD from 2% (14/678) to 0.3% (1/293) ($P = 0.04$).

The UB incision site became invisible in 94.5% (277/293) of the subjects within 6 months. A wider lateral scar of a case with LWD was still remarkable at 6-month follow-up. She declined any revision and is still on anti-scar silicone gel with improvement at the last follow-up (1.5 years).

DISCUSSION

Ideal wound closure yields an excellent approximation with good wound eversion and without tension. Surgical incision stimulates the healing process which in reality is a complex and continuous process with four different stages: Hemostasis, inflammation, proliferation (up to several weeks), and maturation (1-week to more than 1-year).⁸ Wound dehiscence is a mechanical failure of wound healing. Risk factors for wound



Figure 4: Technique of upper blepharoplasty with tension relieving suture: Marking (top-left), skin excision (top-middle), passing the tension relieving buried suture (6-0 polyglactin) from the upper (top-right) and then lower (bottom-left) edge of orbicularis/subcutaneous tissue, appearance of the tension relieved wound (bottom-middle), and final wound after skin suturing (6-0 nylon)



Figure 5: Pre- and post-operative (6 months) photos of the upper blepharoplasty incision using 1–3 tension relieving suture at the lateral wound

dehiscence are anemia, malnutrition, malignancy, obesity, diabetes, infection, wound tension, hematoma, hypoxia, and elderly patients.^{9,10} It was more often observed at 9.2 days (6–15 days) postoperatively.¹¹

The effect of gravity, orbicularis muscle contraction in the crow's feet, and weakness of the lateral frontalis muscle results in lowering of the lateral third of the eyebrow. The skin on the lateral eyelid is somehow thicker which possesses a thin layer of subcutaneous fat. This bulky skin with an absence of fixation to the deeper tissues accounts for the lateral hooding. With increasing age, lateral hooding becomes an integral part of excess eyelid skin. Since eyebrow and eyelid form an esthetic unit, it is necessary to correct the droopiness of the lateral third of eyebrow and cutaneous excess by either eyebrow lift, more skin excision on the area of the lateral hooding, or both. The hooding, if not addressed in the first place, will usually result in an unsatisfied subject who requires a second procedure of elliptical hooding excision which may end up with complications such as lacrimal gland damage.¹² Rees *et al.*¹³ recommended a brow or temporal lift in those patients in whom a maximal amount of skin has been removed from the upper eyelid but lateral skin fold persists. It could also be addressed with postoperative botulinum toxin injection.¹⁴

Traditional UB¹⁵ includes an elliptical skin excision which was modified to the shape of a scalpel blade⁵ by widening the lateral excision in order to address the lateral hooding in subjects with normally positioned eyebrows and little if any ptosis of the lateral eyebrow. Bellinva *et al.*⁶ recently modified this technique into a wide lateral excision but a much higher position, almost close to the sub-brow area, to eliminate the lateral hooding without any need for eyebrow manipulation. Our technique was almost the same as scalpel shape incision⁵ [Figure 2] even though the marking and skin excision were tailored based on the subject's desire, age, amount of lateral hooding, and skin quality. Although both studies^{5,6} did not report any LWD after such a wide lateral excision with either subcuticular⁶ (6-0 nylon) or skin⁵ sutures (6-0 nylon), we had observed LWD [Figure 1] in 2% (14/678) of the subjects with UB at their first follow-up visit after skin suture removal (2 months) between 2003 and 2009. The LWD was significantly visible and red in the first couple of months after surgery but gradually became a hypo-pigmented depressed scar which was less visible even though it was a concern from the subject's perspective. Long-term followup of our case series with early lateral wound gap showed a wider incision scar at the site of the wound gap. Revision of the lateral wound was offered to all subjects. In the presence of mostly healthy subjects, same UB technique, interrupted skin suturing (6-0 nylon), and no postoperative infection or hematoma, it seemed that a wider skin excision and consequently wound tension, observed during skin closure, were the main reasons for developing LWD after skin suture removal. LWD was

observed in two subjects (2/142, 1.4%) in another study.¹ Kouba *et al.*² reported that they used one 5-0 vicryl deep dermal suture to approximate the lateral wound edges and standardize wound tension before using skin suturing. One of the cases (1/36) in their series who had cyanoacrylate adhesive on her skin incision developed wound dehiscence on both sides of the single deep dermal vicryl suture.² No wound dehiscence was reported by the others.^{16,17} Tension-free skin closure is strongly recommended.¹¹ Different surgical techniques have been introduced to prevent the dehiscence where the wound is under tension in other parts of the body.^{18,19} Sadick *et al.*¹⁸ suggested buried dermal mattress suture technique for closing the wounds under tension. Har-Shai and Hirshowitz⁵ performed extended UB for addressing lateral hooding, removed the skin sutures on the fifth postoperative day, but used adhesive strip on the lateral aspect for another 3 days, where they believed, maximal tension of the suture line is located. Although they reported no wound dehiscence, visible scar widening was observed on the lateral aspect of the incision in younger patients.⁵

The majority of our subjects looking for facial rejuvenation are young/middle age women.²⁰ The mean age of the subjects in Group 1, where there was a need for tension relieving suture, was significantly younger (41.4 years) than Group 2 (56.1). They mostly had a relatively well-positioned eyebrow and mild to moderate hooding. Recognizing the subjects at risk of such a complication intraoperatively and using this technique significantly decreased the rate of LWD from 2% (2003–2009) to 0.3% (2009–2013). Although the number of subjects in Group 1 (68/293, 23.2%) in comparison to the frequency of LWD in the audit (2%) showed an overestimation, we believe that overestimation rather than underestimation would result in better wound healing. In fact, the technique has recently been used more frequently.

Limitation of this study is the subjective (surgeon) assessment of the wound tension and lack of quantification of wound tension. Although the two groups in this comparative study were statistically matched with regard to the associated eyebrow procedures, including two groups undergoing just the UB procedure would allow more definitive conclusions. A prospective randomized controlled study of all cases with UB could more effectively determine whether and how much this technique is beneficial, even though the randomization may deprive some cases that might require tension relieving sutures.

CONCLUSION

LWD occurred in 2% of the subjects with UB between 2003 and 2009. Intraoperative assessment of lateral wound tension and if necessary, placing 1-3 absorbable buried tension relieving sutures (6-0 polyglactin) before the skin closure (6-0 nylon) resulted in a significantly ($P = 0.04$) lower rate of LWD (0.3%)

and no complications in this series. Subjects who required tension relieving sutures were significantly younger.

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Conflicts of interest

There are no conflicts of interest.

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